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Not a game over

Games' utilization in the mental health rehabilitation of children and adolescents, a literature review

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Bachelor's thesis
April 2015

Degree Programme in Nursing
School of Health and Social Studies

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Description

Author(s)	Type of publication	Date
Anttila, Kaisa	Bachelor's thesis	14.04.2015
		Language of publication: English
	Number of pages: 69	Permission for web publication: x

Title of publication

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Degree programme

Degree programme in Nursing

Tutor(s)

Raitio, Katja

Assigned by

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Abstract

The purpose of this thesis was to survey the utilization of games in the mental health rehabilitation of children and adolescents. The aim was to collect research-based information about the utilization of games by using a literature review with a systematic approach as the research method. As the searches conducted for the study gave no Finnish studies as a result, the analysis was based on international research.

A search from the electronic databases produced six articles. After an additional manual search through the reference lists of these articles, eight articles were included in the final material. Sentences that answered the research question were typified, and these were further organized into themes.

The three main themes concerned the utilization of games from the perspectives of healthcare, the patient and society. Games were utilized in the treatment of different disorders, for example, as therapy tools, as part of the treatment process and in supporting the patient's commitment to the treatment. From the patients' point of view, the games provided relaxation, supported empowerment and simulated real-life. From the social point of view, games were found to be suitable for different care environments and patients. Moreover, games were seen as financially efficient and easily distributable care methods.

Based on this thesis, there has already been successful and versatile utilization of games to some extent in mental health rehabilitation internationally. However, the evidence provided by the material could not be considered very strong, thus indicating the need for further research.

Keywords/tags (subjects)

Games, mental health rehabilitation, children, adolescents

Miscellaneous

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Kuvailulehti

Tekijä(t)	Julkaisun laji	Päivämäärä
Anttila, Kaisa	Opinnäytetyö	20.04.2015
	Sivumäärä 69	Julkaisun kieli Englanti
		Verkkojulkaisulupa myönnetty: x

Työn nimi

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Games' utilization in the mental health rehabilitation of children and adolescents, a literature review

Koulutusohjelma

Hoitotyön koulutusohjelma

Työn ohjaaja(t)

Raitio, Katja

Toimeksiantaja(t)

-

Tiivistelmä

Opinnäytetyön tarkoituksena oli kartoittaa pelien hyödyntämistä lasten ja nuorten mielenterveyskuntoutuksessa. Tavoitteena oli systemaattisen kirjallisuuskatsauksen metodia soveltaen kerätä tutkimustietoa pelien hyötykäytöstä. Aineistohauissa suomalaisia tutkimuksia ei löytynyt, joten aineisto-analyysi pohjautuu yksinomaan kansainväliseen tutkimukseen.

Elektronisten tietokantojen hauissa tutkimukseen valikoitui kuusi artikkelia. Näiden artikkelien lähdeluetteloiden käsinhaun jälkeen lopullisessa analysoitavassa aineistossa oli yhteensä kahdeksan artikkelia. Aineisto käsiteltiin aineistolähtöisesti tutkimuskysymykseen vastaavia lauseita tyypitellen, joiden pohjalta muodostettiin teemoja.

Kolme pääteemaa käsittelevät pelien hyödyntämistä hoitotyön, potilaan ja yhteiskunnan näkökulmasta. Hoitotyön näkökulmasta pelejä oli hyödynnetty erilaisten häiriöiden hoidossa, terapian työvälineenä, hoitoprosessissa ja hoitoon sitoutumiseen tukemisessa. Potilaan näkökulmasta pelit toimivat rentouttavina, voimaannuttavina ja arkielämään simuloivina. Yhteiskunnan näkökulmasta pelit ovat moniin hoitoympäristöihin ja eritaustaisille potilaille soveltuvia, sekä taloudellinen ja helposti levitettävä hoitomenetelmä.

Opinnäytetyön perusteella pelejä on jo jossakin määrin hyödynnetty onnistuneesti ja monipuolisesti mielenterveyskuntoutuksessa kansainvälisesti. Aineiston näytön aste jäi kuitenkin vajaaksi, joten aiheesta tulisi saada vahvempaa tutkimusnäyttöä.

Avainsanat (asiasanat)

Pelit, mielenterveyskuntoutus, lapset, nuoret

Muut tiedot

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1 Introduction

Problems with mental health and substance abuse are a growing public health issue. The amount of disorders has significantly grown and at the same time the amount of disability pensions related to these problems has increased. As a consequence, the amount of indirect costs has drastically multiplied compared to the direct costs of mental health and substance abuse healthcare. Also the service system in Finland is very incoherent: some of the services are provided by municipalities, some by different associations and some by private service providers. (Mielenterveys- ja päihdesuunnitelma 2012, 13.) The need for improvement on healthcare on account of these facts is apparent. Not only is it unbearable for the society, because of the growing costs and losing workforce to early pensions, but also to the citizens in need of help. In the fear of being stigmatized it is difficult to ask for help, but the confusing system providing it isn't helping either.

YLE news website reported in October 2014 that the Universities of Jyväskylä, Tampere and Turku start working on a research project on how play, interactive media and network services change the society: our ways to learn, work and have fun. In the article professor Mäyrä from University of Tampere says that all the more professions have to face the cultural change that gamification brings, when games spread beyond entertainment. (Mansikka 2014.) About a month earlier Savon Sanomat interviewed Rovio Entertainment's user experience leader Aaltonen, who argued that health is going to be a "megatrend" along with mobile gaming. Aaltonen says that the few available health affecting games won't engage players, because they don't appeal enough to emotions and are boring. (Gråsten 2014.) Is health going to be just another source of entertainment? How is this going to improve the situation? Aren't games just a waste of time and money, only a media creating exclusion and ill-being?

Playing video games is the source of violent behavior in children, children playing games aren't interested in the world around them, spending a lot of time in the in-

ternet makes the youth asocial and incapable of feeling empathy, board games are for children, and only old people play cards. Playing and gaming seems to be viewed as childish interaction, and the harm caused by videogames is probably considered as common knowledge by now. Today's society depends a lot on technology, though, and whereas Finns used to proudly present Nokia as *our* intervention, now it's place might've been taken by Angry Birds. In their study, Granic, Lobel & Engels (2014) concentrate on the positive effects of playing video games, and argue that media and majority of scientific research focuses on negative effects of video games, presenting a very biased view on the matter. They argue that video games are a way to change behavior – for the good or the bad. Engaging, emotional video game experiences can add to the knowledge of the player and through actual rehearsing there's chance to imply it to real life behavior. (Granic et al. 2014.)

Yet there hasn't been a wild outburst of new games with "proven health benefices". Though there's games like the HabitRPG and DepressionQuest that address personal issues, they've stayed in the knowledge of a rather small audience and have absolutely none research-based proof about the benefits, if there is some. Any healthcare professional would probably shake their heads at the idea of using them as a natural part of their work. But the idea is out, and what actual research-based knowledge we already have, it seems worth investigating.

The purpose of this thesis is to present different ways in which games have been used in mental health rehabilitation of children and adolescents. Literature review with systematic approach was used as a research method to collect material and the results were inductively analyzed into various themes responding to the research question. Themes emerged from the material portray various viewpoints on how games could be utilized in mental health care.

2 Games

In his book “Homo Ludens” published 1950, Johan Huizinga displays six characteristics of play. According to Huizinga, play is voluntary, pretense, compelling, limited by time and place, based on rules and a social activity, where participants form a group. Michael & Chen (2005) claim that the “higher forms of play” might be in fact games, whether they be digital or traditional games. They believe that games build on same basic principles as play. (Michael & Chen 2005, 19.) Granic, Lobel & Engels (2014) also claim that play and gaming have similar functions. Granic et al. (2014, 57, 75-76) present that video games address the same emotional themes as play, and can change the behavior of an individual, but the nature of the change can be regarded as positive or negative.

Clark Abt (1987) defines games as an activity within limited context, where two or more participants try to achieve their goal, but their relationship, whether they're rivals or co-operates, can vary. Limited context usually means the rules of the game, which Bernard Suits (1978) thinks are an essential part of the game, as they challenge the participants to find unconventional solutions. According to Suits, the rules are made to preclude the conventional ways and are abided to enable other solutions. But because games are a worldwide phenomenon with a lot of history, concerning many types of games, characteristics listed above are just some viewpoints of the word. (Michael & Chen 2005, 18.)

Playing games is a part of child's normal social development (Psychology 1998, 298). Various psychological theories back up the use of games as a facilitator to children’s development, for example when it comes to physical, social, cognitive and linguistic development, and according to Smilansky & Shefatya (1990) play and learning go hand in hand. (Hromek 2004, 5.) In Smilansky's (1968) four stages of play, two last steps of the development are dramatic play and play based on rules. Many theorists admit that pretended play has some role in development of the theory of mind, but

the actual significance is under debate. For example Leslie (1987) has presented that metapresentation finally leads to development of theory of mind. (Psychology 1998, 298-299.)

According to Connoly et al. (1988) in a game involving multiple players, children learn prosocial skills like sharing, negotiating and explaining. Bandura's (1986) social cognitive theories state that children learn by adapting observed and imitated behavior into their internal characteristics, thus best learning results are acquired by using coaching, modeling, social reinforcement and behavioral rehearsal. According to Vygotsky (1976) adults can help children learn by using language to guide the child through the experience with helping them to think with the right concepts and facilitating connection with previously learned things and the available resources. (Hromek 2004, 5-6.)

Games are familiar to all ages as a form of entertainment. Pelaajabarometri -survey has been carried out for four years, representing the amount of people playing both digital and non-digital games in Finland. According to the survey, approximately 88% of Finns aged 10-75 play something actively, at least once a month. Young people (aged 10-29) typically spend around seven hours a week playing digital games. (Mäyrä & Ermi 2014, 26, 29.) The distribution between different game types varies a little within gender in ages 10-19. Both boys and girls report to play almost as actively computer games (51% of all), cards (57%), board and parlor games (58%), but boys (71%) tend to play more console games than girls (46%), as girls (77%) tend to play more mobile games than boys (68%). (Mäyrä & Ermi 2014, 37-40.) Besides entertainment, educational games were played actively by only 5% of the survey participants (Mäyrä & Ermi 2014, 17).

2.1 Serious games

The 1990's was the time of "edutainment", which stands for all educating media using entertainment, mostly targeting preschoolers and new learners. "Serious games",

as a term however, covers all types of education and all ages. Clark Abt (1987) has stated that games can be played either seriously or casually, and in serious games, the educational purpose doesn't eliminate the fun in the game. One's training simulation can be other's entertainment, but also entertainment games can be reapplied to more serious purposes. (Michael & Chen 2005, 21-24.)
To put it simply,"serious games" refers to games that are not designed for the sole purpose of entertainment, but aim to train, advertise, simulate or educate. "Serious games" is an umbrella term for various types of games. (Michael & Chen 2005, 21.)

Since the gamification of medical interventions are still in the square one, only a few of the "health games" invented are really scientifically examined and proven useful. Lacking the game industry knowledge, health care professionals struggle with the most important parts of the game: making it fun and engaging, thus not reaching the full potential of the innovation. (Granic, Lobel & Engels 2014, 73-74.)
Speaking of boring, games and school also share the same type of characteristics. Both are not "real", as they only **represent** reality, both need the attendant's attention, both are set in a certain time and place, both are based on rules and are social activity. Clark Abt (1987) states that games represent the subjects more dramatically and allow the player to assume roles, make decisions and get feedback easier and faster than in the real world, where errors can have drastic consequences. The new generation is very used to video games, so they are keener to play and learn. (Michael & Chen 2005, 24-26, 27.)

Hromek (2004, 6), in her book about the games she has developed, describes the concept of therapeutic games, which are meant to teach socio-emotional skills and improve emotional resilience, especially meant for children who have problems in learning prosocial skills. In her board and card games, the adult who is guiding the game has to have knowledge about Life Space Interview (LSI) techniques. She states four advatages, which the game platform provides: learning "unnoticed" while having fun and knowing the basic concept of playing games, active engagement, thus

learning while playing, safe practice environment for new skills and the possibility of making clinical observations. (Hromek 2004, 6-7.)

So, what learning has to do with games? James Paul Gee has written that taking up a challenge can be forced as in school, or lured as in a difficult video game with profit for succeeding (Michael & Chen 2005, 25). Also, as mentioned before, play and games are very similar concepts, thus learning through games is very natural. As it is later noted, therapies like cognitive-behavioral therapy uses the basics of learning to rehabilitate dysfunctional thoughts.

2.2 Pelaten terveeks?

Technology has been a part of the everyday life for some time now, but also games are slowly making their progresses outside the amusement field, the technology development making it possible to produce more convenient games for example for healthcare. To match up to the demands of growing need for health care and the increase in healthcare costs, the European Union has expanded their support of development and use of health games. (Kaleva, Hiltunen & Latvala 2013, 12-13).

”Pelaten terveeks?” is a project of Jyväskylä University of Applied Sciences, which has taken place during the year 2014 and aims to gather information of how adolescent and adult mental health rehabilitation clients can utilize games in improving their control of everyday life. The aim of the project is to gather information about the possible use of gamification as a method in mental health. The objective is to bring together the professionals in gaming industry and healthcare, but also gather the needs of the future users, psychiatric rehabilitation clients. The project has received support from the European Comission's European Social Fund and Finland's Center for Economic Development, Transport and the Environment. (Raitio & Hopia 2015.)

Linked to the “Pelaten terveeks”-project the original aim of this bachelor thesis was to survey video games developed precisely for mental health rehabilitation purposes.

However, the preliminary searches showed that most games developed so far has been for physical rehabilitation. Thus the aim of the research was redirected to determine whether games in general have been utilized in mental health at all. Also the overlook on the preliminary searches showed that studies tended to focus on children and adolescents, thus narrowing down the subject of thesis even further.

3 Mental health

Mental health can't be described with one simple explanation. Mental health is affected by genetics, early interactions, life experiences, relationships, social network and stress. There's no absolute or static mental health due to natural fluctuation of it. There's no perfect mental health either – nor perfect absence of it. Mental health is defined by cultural norms, which dictate what sort of behavior is socially acceptable in each particular culture. The most solid norm that concerns mental health and mental disorders, is the law. (Toivio & Nordling 2011, 84-85.)

There's not a lot of epidemiologic research about adolescents' mental disorders in Finland. The most significant one is Gustav Amnelli's (1974) follow-up study of offspring born to mothers born in 1955, where 17% of the children in question had used mental health services by the age of 14. Fredrik Almqvist (1983) continued following the same cohort and found out that 15% of the children then aged 15-21 had used mental health services or had been diagnosed as asocial. In 1990 was published a study about children taken into social services' institutions in 1988, where it was concluded that approximately 70% of the children in the institutions suffered from some sort of mental health problem. (Aalberg & Siimes 2007, 291-292.)

According to the statistics by Official Statistics of Finland (OSF), in 2013 mental health inpatient care of children had declined since 2008, but the number of outpatients had grown since 2006, 68% with adolescents and 37% with children. Most children

suffered from emotional or behavioral disorders. In the whole country some psychiatric special medical care services were used by one child aged 0-12 to 1000 children from the same age group, and eight children aged 13-17 to 1000. (Rainio & Räty 2015, 6, 8.)

Ages from 0-16/22 have been said to be the base stage of human development. Until approximately the age of 20 years development is more apparent, some even think measurable. Though regrettably it has been thought that there's no major changes in a person after that, actually the changes change their nature and become more internal and individual. (Dunderfelt 2011, 95.)

3.1 Children's mental health

In Finland school begins at the age of seven, when there's multiple physical, mental and individual changes happening in a child. Attending school sets new challenges for the child, but one also has new abilities to meet these challenges and develop individual characteristics. During the ages from 8-10 individuality and critical thinking start to develop. Critical thinking focuses towards teachers and the child oneself. Child's own inner world and sense of own separation from others becomes stronger. Thinking is still very imaginative and wondrous. (Dunderfelt 2011, 81-82.)

Ages from 6/7-12/14 are called latency stage of childhood, where there's no major changes in psychosexual development, and sexuality is - in a manner of speaking - sleeping. Identifying with own sex that started in preschool continues, especially identifying with the same sex parent. One important developmental task is forming the sense of duty and feeling of joy through performing. At this age child needs to feel involved and needed. Child's independent thinking skills are growing, but learning of abstract concepts happens mainly through concrete action. (Dunderfelt 2011, 84; Toivio & Nordling 2011, 155.) Developmental tasks in this stage are also the liberation of primary emotional dependency to the parents, absorbing social skills and moral codes, and independent thinking. Thinking also develops from concrete to-

wards more conceptual. Learning to give and receive love is essential to emotional development at this stage. (Toivio & Nordling 2011, 155.)

Child's mental health is evaluated through age appropriate methods: interviewing, observations, questionnaires and play. Psychological evaluation gives information about the cognitive skills and mental structure. Child's life situation and developmental history should be evaluated in close collaboration with the parents and possibly include school or daycare employees. Also an important factor is the somatic and neurologic status of the child. Children's disorder diagnostics are based on symptoms rather than the development of the presumed disorder. When evaluating the child's symptoms, the individual development stage and age should always be taken into account to determine what is normal. E.g. motoric activity, impulsivity, attention and memory functions change through age in ordinary development. Psychiatric or neuropsychiatric diagnosis is set only if there is long-term harm in age appropriate survival in everyday functions on the child. Children can suffer from diverse symptoms, which can challenge the diagnosis. (Aronen & Sourander 2014.)

Most children who are at risk for disturbed development can be recognized very early, and only a small portion of children's mental health disorders need special health care. Children won't search help for mental health problems by themselves, but are guided to services by parents, other adults, daycare or school personnel. According to LAPSET-survey in Turku in 1989 only 2% of children aged 8-9 had been in mental health services within their lifetime, but in year 2005 the number was 8%, thus the threshold to search for help could be said to have lowered. This on the other hand put stress on the service system, creating long waiting periods to receive care. (Aronen & Sourander 2014.)

3.2 Adolescents' mental health

Adolescence can be divided into three periods: early, middle and late adolescence. Adolescence is a period of polarity, where opposites collide and individuality is being

search through the collisions. (Dunderfelt 2011, 84-85) There's number of theories about the course and aims of adolescence, but some similarities between them exist. Adolescence is very critical age. Biological changes show as physical growth and sexual maturing, physical changes mature child to a teen and mental image of self relies strongly on the physical image of own body. (Toivio & Nordling 2011, 157.)

Much of childhood problems can be solved and fixed during adolescence, when the adolescent has gained more maturity and mental attributes to face them. The main aim during adolescence is to reach self-acquired autonomy, which requires solving following three developmental tasks: separation from parents and connecting back to them in a more adult manner, constructing a body and sexual image of self and relying on peers for help during growth and development. (Aalberg & Siimes 2007, 67-68.) Puberty is a stage where humans develop in different schedule according to their gender. Girls reach puberty approximately as 11-12 –year-olds and boys as 13-14 year-olds. Socially early or late matured youths are treated differently depending on their gender. Adapting to fast changes is hard for the adolescent oneself too. (Toivio & Nordling 2011, 157.)

Ages from 12 to 15 is called early adolescence, which could be named as the time of relationship crisis. Early adolescence begins from the biological puberty, and the major events are protests against parents and other authorities and creating new relationship with peers. (Dunderfelt 2011, 84.) The need for independency creates a conflict between the neediness of childhood. Gaining independency from parents happens mostly through defending their own privacy and friends. The adolescent is confused with the changing body. The adolescent's self-knowledge is still developing, which leads to very self-centered behavior. (Aalberg & Siimes 2007, 68.)

Ages from 15 to 18 is called middle adolescence, the time of identity crisis. During this stage adolescent identify with other people, have crushes, clear the concept of self, test own limits and create deep relationships. (Dunderfelt 2011, 84-85.) At this stage the development of sexuality is at the center. Peer relationships don't only af-

fect the construction of sexuality but also the whole personality. (Aalberg & Siimes 2007, 69-70.)

Late adolescence is ages 18-20/22, time of ideological crisis. This is the age where the stormy teenage phase gradually becomes more serene. During this stage the adolescent ponders on their own position in the world and begins independent life. (Dunderfelt 2011, 85.) Relationship towards parents becomes more adult and the adolescent strives to understand their reactions and lifespans, approaching them neutrally and in an equal manner. (Aalberg & Siimes 2007, 70-71.)

Havighurst has presented seven developmental tasks in adolescence: achieving new and more mature relations with both genders, developing a masculine or feminine role for self, accepting own physical appearance and learning to use own body appropriately, gaining emotional independency in relation to parents and other adults, preparing for marriage and family life, taking charge of personal finances, developing a set of ideological, moral and personal values as a guide to life, aiming and achieving socially responsible behavior. Encountering and conquering these challenges enable the development of the individual person and progression to the next developmental stage. (Dunderfelt 2011, 85.)

When the developmental tasks of different stages don't actualize, development becomes pathological and transpires as different symptoms or disturbed development, which need to be intervened. Early identification of symptoms prevents the disorder from inflicting suffering and possibly improves prognosis. (Toivio & Nordling 2011, 155-156.) Mental health disorders incidence in adolescence is approximately double the amount compared to childhood, and almost the same as in adulthood. Incidence depends on the environment (more in cities than in rural areas) and social environment. (Marttunen & Kaltiala-Heino 2014.)

Searching help for mental health problems varies among different age groups in adolescents. Those in late adolescence can usually evaluate their situation and look for

help by themselves or with help from parents. Those in early adolescence usually have very little motivation to search for help, and even then they conceal it very carefully. Other way to react is to deny all mental health problems, but behave so that they are directed to get help, as if against their will and need. (Aalberg & Siimes 2007, 294-296.)

Long-term anxiety, insecurity, shame and depressive symptoms are signs of trouble in forming identity. Warning signs for suicidal risk are for example running away from home, problems at school, self-mutilation, change in apetite, problems with sleep, depressive symptoms, isolation from friends and preparing for death. (Toivio & Nordling 2011, 159.) Identifying a disturbed development in adolescence is about three things: meeting the diagnostic criteria of the disorder, defining the natures of the halt in development and the imbalance that disrupts the normal everyday life. Developmental challenges can be noticed as clear changes in the adolescent, like for example withdrawing from peer relationships, loss of interest in self or peer interests, intense roiling or abnormally difficult relationship with puberty. In a psychiatric evaluation of the adolescent there should be considered the direction of the development (advancing versus regressive), peer relationships, relationship with parents, performance (e.g. school) and relation to own body. The amount and quality of symptoms determines whether or not there is a disorder. The adolescent's own experience of the need for help is usually a sign of a disrupted development, which should be taken seriously. Usual for adolescents is comorbidity, which means suffering from multiple mental health disorders at the same time. The most common disorders in adolescents are anxiety, mood disorders, eating disorders, problems with adjustment, neuropsychological disorders, being anti-social, substance abuse, psychosis and self-harming. (Marttunen & Kaltiala-Heino 2014.)

3.3 Mental health rehabilitation of children and adolescents

The World Health Organization has defined the targets of rehabilitation as following terms: impairment, disability and handicap. Impairment is only a descriptive term to

the condition, whereas disability means the actual consequences of the impairment. Rehabilitation focuses on the disability, trying to reduce the impact of the impairment on the individual's life, raising the importance of functionality to the same level with pathophysiology. Handicap describes the social consequences of the impairment, which extends from general attitudes towards the impaired, to the accessibility of the environment. In WHO's new classifications disability is mentioned as activity and handicap as participation, which makes the emphasis of the matter to be more on the individual's abilities, rather than the restrictions caused by the impairment. (Barnes & Ward 2005, 4-5.)

In children's and adolescents' mental health rehabilitation it's impossible to draw a line where care ends and rehabilitation begins. In both the goals are similar: enabling healthy and age appropriate development, and learning how to communicate and express oneself. Therapeutic, educational and social actions are part of both care and rehabilitation with children and adolescents. (Moilanen 2008.) The basic characteristics in all rehabilitation processes are the educational aspect, individual program planning, involving the patient's inner circle, setting goals and measuring progress, addressing the problem in a multidisciplinary way, and the process plan being built on the individual case. (Barnes & Ward 2005, 2-3.)

Sometimes problematic mental health symptoms in adolescence are caused more by the surrounding environment than an actual disorder, in which case social support is more appropriate than psychiatric support (Marttunen & Kaltiala-Heino 2014). Safe growth environment is helpful for both boys and girls when it comes to forming balanced identity. Clear boundaries and consistency are in a very important position in bringing-up an adolescent. Setting boundaries shows trust to adolescents about their readiness to comply with them. Testing boundaries, rebellion, black and white-thinking and questioning is part of normal development and process of becoming independent. (Toivio & Nordling 2011, 158-159.)

Common aims in children's and adolescents' mental health care and rehabilitation are healthy development and learning. To achieve this, three tasks has to be reached. First, effecting the developing environment so that the child has a chance to develop healthily. This can mean e.g. moving the child to special education or providing family therapy. Second, acquiring age appropriate development. In this case the interventions has to focus on the child in question, to evaluate and rehabilitate one's abilities and emotional capacity. And third, finding the means for the child to communicate with one's surroundings, so one can express feelings, emotions and wishes. (Moilanen 2008.)

Usually on the background of children's mental health problems are both biologic-genetic and psychosocial unfavorable accumulation and risk factors' synergy, thus the care should address whatever factors are found behind the disorder. Individual forms of psychotherapy is usually either CBT or psychodynamic therapy. CBT has been confirmed to be effective at least in childhood depression, ADHD and behavior disorders. Family guidance is always included with the individual psychotherapy. (Aronen & Sourander 2014.)

The persistence of psychiatric conditions through adolescence to adulthood is still questionable, though there has been found some connections in longitudinal studies. Usually the onset of a mental health disorder is between the ages of 11-18 and the persistence depend on the severity of the disorder. Several adolescence disorders have been discovered to lead to similar disorders in adulthood. (Marttunen & Kaltiala-Heino 2014.) Especially aggressive and boundary-breaking behavior seem to continue as mental health problems in later ages (Marttunen & Kaltiala-Heino 2014; Aronen & Sourander 2014). Though on the other hand, it has been proven that some personality traits are relatively permanent from childhood to adulthood. Restless temperament trait and attention and activity disorders in childhood predisposes to behavioral disorder in adolescence and dissocial personality disorder in adulthood. Whereas withdrawing, sensitive and socially anxious child might have social phobias

or some other anxiety disorder in youth, which might develop into anxious personality disorder in adulthood. (Marttunen & Kaltiala-Heino 2014.)

3.4 Current treatment and rehabilitation methods

The need for mental health care is based on mental health problems and disorders that the patient wants to be cared for. According to Finnish studies a third, or half at the most, seeks help for their mental health problems. Usually there has been symptoms of problems or disorders, like anxiety or mood disorders, for years before the patients seeks help, though especially in severe conditions early treatment is vital for better prognosis. After the new decrees, like the timeframe set for receiving treatment, there hasn't been a lot of congestion in the need for services, but this might be caused by the lack of psychotherapy services or the lack of information of the services. There is still a lot of stigma about mental health problems in the society. According to the national mental health and substance abuse plan municipalities should develop and add lower threshold services. Municipalities and unions created for special health care have to take care that mental health services are provided as vastly and appropriately as there is need. (Lönnqvist, Morig & Henriksson 2014.) According to the Mental Health Act, there should be primarily outpatient services, and independent search for help and survival has to be supported (L 14.12.1990/1116).

Under school-aged children should get into treatment through maternity clinic and adolescents through school and student health care. Also "etsivä nuorisotyö" ("searching youth work") is being developed as a way to get into mental health and substance abuse care. Network services are being developed to be a part of the local services. (Mielenterveys- ja päihdesuunnitelma 2012, 53.) On primary healthcare there is school and student healthcare, also in big cities there might be youth outpatient clinics run by health centers or private associations. In some cities there's also clinics for crisis type of situations to clear acute situations and evaluate the need for special health care. Mental health outpatient clinics for adolescents and hospital wards are part of special health care. Also social services have many services for ado-

lescents. Youth associations, church and volunteer associations complement the government run services. (Marttunen & Kaltiala-Heino 2014.) Because child's development is in tight connection with the surrounding environment, taking the family, school and other parts involved is essential in children's mental health care (Aronen & Sourander 2014).

Outpatient care of adolescents consists of supportive treatment, conversations and different forms of psychotherapy. Supportive treatment is usually given in the natural living environment of the adolescents. Hobbies, school, friends and parents are part of the support system. Clarifying conversations are provided by professionals specialized in adolescence, like school nurses, social workers, psychologists and teachers. The aim is to clarify the life situation and the need for support. (Marttunen & Kaltiala-Heino 2014) Other care methods are family therapy, working with wider network, biological care methods and inpatient care (Aronen & Sourander 2014).

Increasing primary health care and outpatient services in mental health prepares for the decreasing of inpatient care. This means increasing and diversifying emergency, mobile and consultation services. When the services are being planned, self-care services should also be taken into account, like peer support or crisis help. These are self-care guides, network services, internet forums and call lines. Coordination and informing of these services could decrease the need of mental health and substance abuse services. Electronic services increase the reachability of the services and especially concerning youth and sparse settlement areas. (Mielenterveys- ja päihdesuunnitelma 2012, 42-43, 49.)

Mental health and substance abuse services are stated to be in need of redirecting of resources and also extra resources in the near future. Redirection should be aimed at primary and outpatient services to prevent, promote and care. On the basis of the progress review, one of the things to be taken care of is the sustaining funding of developing network services and defining them nationally coherent. For many years, the portion reserved for mental health and substance abuse services has been de-

creased in the healthcare budget. (Mielenterveys- ja päihdesuunnitelma 2012, 67-69.)

Offered care has to follow Käypä hoito recommendations, in which is mentioned that according to non-emergency criteria the patient should be able to get appropriate psychotherapy within six months. Services have to take into account the cultural and linguistic background of the patient. (Mielenterveys- ja päihdesuunnitelma 2012, 19-21.) Also those under 23-year-old have to be able to get special health care treatment of mental health and substance abuse within three months regardless of place of inhabitance (Mielenterveys- ja päihdesuunnitelma 2012, 19-21; L 30.12.2010/1326). Health Care Act (L 30.12.2010/1326) also states that school health care and student health care are responsible for recognizing students' problems, need for care and necessary examinations early, supporting the student and families, and advise them to further care when needed.

Therapy approaches

Psychological therapies can be roughly divided into two categories: insight-oriented, like psychodynamic and humanistic, and action-oriented, like cognitive therapy and behavior therapy. In insight-oriented therapies the focus is on the patient understanding the problem and in action-oriented therapies the focus is on changing the behavior and thinking, not only through talking but also rehearsing the action. (Psychology 1998, 567.)

Psychodynamic therapies are based Sigmund Freud's theory that most of the mental functioning happens in the unconscious side of the mind. Problems with mental health are caused by conflicts between the id, the superego and the ego. Through several techniques the therapist aims to create a hypothesis about the conflict within the patient and presents this to the patient as the underlying thinking behind the behavior and experiences. (Psychology 1998, 567-569.)

Behavioural therapy is based on theory of learning, and sees most problems to be produced by earlier experiences, which have affected the person's behavior. For example, in systematic desensitization developed by Wolpe (1958), the patient suffering from anxiety is gradually exposed to the source of anxiety. Techniques like modelling – observing and learning from someone with the desired behavior- and token economy – rewarding for desired behavior – are part of behavioral therapy. (Psychology 1998, 570-571.)

Cognitive approach concentrates on how people observe and process information, though there was a lot of dispute whether the thoughts truly effect behavior. Thoughts are, after all, hard to observe objectively. Cognitive view began to rule in psychology after it was seen that behavior couldn't be explained without the concept of internal mental states. One of the first to develop cognitive methods to treat disorders was Aaron Beck. (Psychology 1998, 571-572.) Below is presented some disorders and their treatment recommendations by Finnish Käypä hoito.

Depression

Mild and uncomplicated moderate adolescent depression care should be started in basic healthcare, consulting special healthcare when needed. Recommended treatment forms are cognitive personal and group therapies and interpersonal therapy modified for adolescents. There's also a lot of clinical experience about psychodynamic therapy used with adolescents, but no controlled researched knowledge. Other acceptable therapy forms are supportive psychotherapy and family therapy. If depression isn't responsive after a month of psychotherapeutic intervention, should anti-depressant medication be started. Combining medication and cognitive therapy might be more useful than monotherapy with adolescents. Follow-up and maintenance care can be carried out as infrequent psychotherapy sessions after intense personal therapy. (Depressio 2014.)

According to Beck et al. (1979) depression might be caused by negative cognitive triad, thoughts about self, the world and the future. Problems in early relationships

produce dysfunctional schemata. These dysfunctional schemata, when person faces a negative event corresponding with some of the said schema, create negative automatic thoughts, which then produces depression. In cognitive therapy the main task is to question these thoughts and their validity, rather than just turning them into positive assumptions. (Psychology 1998, 572-573.)

Borderline personality disorder

In borderline personality disorder psychotherapy is essential, possibly combined with other care methods. Evidence-based therapies are dialectic behavior therapy, schema therapy, mentalization based therapy and transference focused psychotherapy. Also family therapy might be useful, but at least some sort of family intervention should be begun at the beginning of treatment. As rehabilitation also group form courses involving e.g. adaptation might be useful. (Epävakaa persoonallisuus 2008.)

Eating disorders

In eating disorders (ED) the line between care and rehabilitation is very blurred. Psychotherapy might be useful if the patient suffers from other mental health problems at the same time. Self-help is usually based on cognitive-behavioral therapy (CBT) and it might help especially patients with binge eating disorder (BED). There's also an internet based self-help program for BED patients in Finnish and Swedish (see Mielenterveystalo n.d.), but on international platforms there's self-help programs offered for all types of ED. There's no scientifically proven use of self-help programs in anorexia nervosa. (Syömishäiriöt 2014)

4 Aim, purpose and question of research

The addicting influence of games, especially gambling has been researched a lot and has been proven to be a disorder (see e.g. Jaakkola 2008), but for example there has been disputes about adding internet addiction to diagnostic criteria (see e.g. Korkeila

2012). The use of games in mental health rehabilitation is a rather novel concept, and compiled information about the subject is hard to find. Thus the purpose of this thesis is to gather information how games have been utilized in mental health rehabilitation of adolescents and children: what methods have been used and what positive effects the use of games has produced. The aim of this thesis is to produce a literature review with systematic approach, where the content of the found articles is analyzed and organized into themes that illustrate the possible ways to utilize games. This thesis can be utilized in future game developing, further research and for professionals seeking information. To achieve this, this thesis aims to answer the following question:

How have games been utilized in mental health rehabilitation of adolescents and children?

5 Conducting the literature review

5.1 Research methodology

The basic function of a qualitative research is to explain and describe, not to make assumptions of the whole population like in a quantitative study. Qualitative study aims to create a theoretically constant basis on a phenomenon. (Eskola & Suoranta 1998, 60-62.) When there's need to acquire assembled and comprehensive from already existing material, a well-made systematic literature review is a scientific method to produce such (Pudas-Tähkä & Axelin 2007, 46-49).

As the research method of this thesis has been applied systematic literature review. Literature review is a collection and analysis of literature written on a specific topic (Aveyard 2010, 5). In a systematic literature review the search methods follow a pattern, which makes the review more valid and reliable (Leino-Kilpi, 2007, 2).

With a systematic literature review existing information can be portrayed as an entity, how much the subject has been studied, with what methods and what sort of results have been produced (Egger et al. 2001, Burns & Grove 3005). Systematic literature review is secondary research to existing studies. (Johansson 2007, 3-4.)

According to Mäkelä et al. (1996, 39) systematic literature review has three aims: preventing the misconceptions deriving from biased selection process, giving each research the credit they deserve and efficient use of already existing material. Like any other scientific research, systematic view needs to be repeatable, which demands detailed prescription of the search progress. (Metsämuuronen 2006, 37.) The review isn't just a collection of scientific articles, but the material collected is analyzed by the researcher. Each article is evaluated in the context of other studies of the same field, which gives each text the value it deserves. Combined information might reveal something completely new. (Aveyard 2010, 5-10.) In a systematic review, the first search is done in appropriate databases, the second from the bibliographies of the found material, the third from selected publication series and finally from unconventional sources, to prevent illusion from the publishing. (Metsämuuronen 2006, 37-38.) In this thesis the first two searches Metsämuuronen mentions have been executed.

5.2 Inclusion & exclusion criteria

To control the amount of research material to be taken into the study, the inclusion and exclusion criteria has to be defined in advance. The purpose of the criteria is to enable gathering a group of studies as representative and reliable of the subject as possible. Inclusion criteria explains the quality of studies that are wanted into the systematic literature review.
(Metsämuuronen 2006, 37.)

The inclusion and exclusion criteria used in this thesis are presented below:

Inclusion criteria:

- Published after January 2003
- Concerns the use of games in/as the treatment of mental health problems of children and adolescents, and presents some results
- The disorder of the participant is addressed/diagnosed/proven
- The game in question has to have a concrete instrument, e.g. a video game or a board game
- Most of the participants are under 18 years old
- Article is in English, Finnish or Swedish
- The article is an original research
- Full text article available for free

Excluded:

- The article is published before 2003
- Concerns something else than rehabilitation and serious games, for example edutainment or diagnostic methods
- The game in question is a parlor game (e.g. musical chairs) or mainly for exercise purposes
- The participants suffer from a developmental, intellectual, neurological or physical disabilities
- The article concerns a theory not tested on the field
- Full article not available for free

These inclusion and exclusion criteria are set to collect material that could answer the research question as well as possible, but also to set some limits to the quality of research. Timeframe was set to find current information, but during the preliminary searches it was noted that there was hardly any studies before 10 years. Criterion on the patients' condition was set to ensure that the study isn't about promotion or prevention, but the treatment of actual disorders. On the quality, the criterion for the field tests is to find practice based information rather than untested theories of

professionals. Because of the financial limitations of this thesis, full articles had to be available for free.

5.3 Review process

The databases chosen for the literature search were CINAHL (full text), Academic Search Elite (EBSCO), ERIC, OVID, PubMed, Arto and Aleksi. All used databases were available in Nelliportaali, through JAMK's student account. The searches were conducted on different dates, which are mentioned with the other information. All databases were set to search articles released after January 2003 or 01/01/2003. All of the databases used Boolean operators and truncate symbols (* or ? or nothing) is used according to each databases' instructions as needed. In CINAHL, EBSCO and ERIC the option "apply related words" finds plurals, synonyms and alternate spellings of the keywords.

No relevant results were found within the Finnish databases Arto and Aleksi (searches conducted described below). The word "psykiatria" combined with different forms of the words "peli", "pelillisyys" and "pelillistäminen" produced over a thousand results, which the first 20 or so articles found didn't prove to have any relevance to the subject, thus the use of "psykiatria" was left out of the final searches. Within the Arto database most of the results concerned gaming as an addiction condition. In Aleksi database results considered relevant by title were actually about neurological and physiological rehabilitation.

Database: Arto (29.11.2014, tarkennettu haku: sanahaku, 2003-)

Table 1. Arto

	Search words	Results	Relevant by title & abstract
1.	(mielenterv?) AND (peli? OR	7	0

	pelillis?)		
2.	(kuntout?) AND (peli? OR pelillis?)	0	0
3.	(hoito) AND (peli? OR pelillis?)	2	0

Database: Aleksi (29.11.2014, 2003-, hakusana)

In Aleksi the ? symbol is not needed to truncate the word and the Boolean operators are in used in Finnish.

Table 2.Aleksi

	Search words	Results	Relevant by title	Relevant by abstract
1.	pelillis JA mielenterv	0	0	0
2.	peli JA mielenterv	21	0	0
3.	peli JA kuntout	18	3	0
4.	pelillis JA kuntout	0	0	0

Database: CINAHL (28.10.2014, Jan 2003 -, apply related words, full text available, all child)

The following combination of search words is included in all the searches listed below with a Boolean operator AND: (*game* OR games utilization OR gamification OR serious game* OR (MH "games") OR gaming)*.

Table 3.CINAHL

	Search words	Results	Relevant by title	Relevant by abstract

1.	(mental health OR (MH ”Mental Health”) OR (MH ”Mental status”) OR (MH ”Research, Mental Health”) OR (MH “Mental Disorders”))	14	1	1
2.	(psychiatric nursing OR (MH ”Psychiatric Nursing”) OR (MH "Psychiatric Care") OR (MH "Psychiatric Patients") OR psychiat*)	6	4	0
3.	((MH "Rehabilitation, Psychosocial") OR psychosocial rehabilitation OR mental rehabilitation OR mental health rehabilitation OR psychiatric rehabilitation OR rehabilitation)	21	0	0
4.	(therapy OR (MH "Behavior Therapy") OR (MH "Cognitive Therapy") OR (MH "Psychotherapy") OR psychotherapy)	73	18	10

Though the age is limited with the “All child”-term, the searches are done again on 9.12.14 the age limit replaced with terms ((MH "Adolescence") OR adolescen* OR (MH "Child") OR child* OR teenag* OR underag*). More results compared to the results below were displayed, but no new related articles were found.

Database: EBSCO Academic Search Elite(22.11.2014, Jan 2003-, Full text, apply related words)

Search word combination *(DE "MENTAL health" OR mental health OR DE "MENTAL illness" OR mental illness OR mental disorder* OR DE "PSYCHIATRY" OR psychiat*) AND (DE "GAMES" OR game* OR DE "GAMIFICATION" OR gamification OR games utilization) AND (DE "ADOLESCENCE" OR adolescenc* OR DE "CHILDREN" OR child**

OR teenag OR underag* OR DE "YOUTH" OR youth*)* produced 322 results. This was too large an amount to sort out by one person, so combination preset was put together with the Boolean operator AND with the searches listed below.

Table 4. EBSCO Academic Search Elite

	Search words	Results	Relevant by title	Relevant by abstract
1.	(DE "REHABILITATION" OR rehabilitation)	20	7	2
2.	(DE "PSYCHOTHERAPY" OR psychotherapy OR DE "THERAPEUTICS" OR therapy)	58	17	9

The combination of *(DE "GAMES" OR game* OR DE "GAMIFICATION" OR gamification OR games utilization)* and search 1 and 2 were also tried, presenting 53 results, but no new articles relevant to the research is found.

Database: ERIC (29.11.2014, Jan 2003-, Full text, apply related words)

The following search word combinations are used in all searches listed below:
(DE "Games" OR game OR gamification OR DE "Game Theory") AND*
(DE "Young Children" OR DE "Children" OR child OR DE "Youth" OR youth* OR DE "Late Adolescents" OR DE "Early Adolescents" OR DE "Adolescents" OR adolescen* OR teenag*).* Later was note that the *DE "Game theory"* did not reveal any additional finds to the searches, thus it had been irrelevant in presented results.

Table 5. Eric

	Search words	Results	Relevant by title	Relevant by abstract
1.	(DE "Mental Health" OR mental health OR DE "Mental Disorders" OR mental	7	4	0

	disorder*)			
2.	(DE "Rehabilitation" OR rehabilitation)	1	0	0
3.	(DE "Psychotherapy" OR DE "Therapy" OR psychotherapy OR therapy)	10	6	3
4.	(DE "Psychiatry" OR psychiat*)	3	0	0
5.	(DE "Nursing" OR DE "Nursing Research" OR DE "Nurses" OR nursing)	3	0	0

Database: OVID (23.1.2014, 2003-, Include related terms)

The first search with following combinations
(adolescen OR child* OR teenag* OR underag* OR youth) AND*
(game OR gamification OR serious game) AND*
(mental disorder OR mental health OR mental illness OR psychiat)*
Resulted in 278 results, thus to narrow down the results, it was combined with the Boolean operator AND with the listed searches below.

Table 6. OVID

	Search words	Results	Relevant by title	Relevant by abstract
1.	(rehabilitation)	59	20	6
2.	(therapy or psychotherapy)	113	44	14

Database: PubMed (22.11.2014, 2003/01/01-, free full text, Child: birth-18 years, Adolescent: 13-18 years, Child: 6-12 years, Preschool Child: 2-5 years)

Following search words were included in every search listed below: *("Game Theory"[Mesh] OR game OR games OR serious games).* Later was noted that the results didn't alter if *"Game Theory"[Mesh]* was excluded.

Table 7. PubMed

	Search words	Results	Relevant by title	Relevant by abstract
1.	("mental health"[MeSH Terms] OR mental health OR "mental disorders"[MeSH Terms] OR mental disorder) AND ("rehabilitation"[Subheading] OR "rehabilitation"[MeSH Terms] OR rehabilitation OR psychosocial rehabilitation)	6	1	1
2.	("mental health"[MeSH Terms] OR mental health OR "mental disorders"[MeSH Terms] OR mental disorder) AND ("therapy"[Subheading] OR "therapeutics"[MeSH Terms] OR therapy OR "psychotherapy"[MeSH Terms] OR psychotherapy)	46	14	10
3.	("psychiatry"[MeSH Terms] OR pshychiat* OR "nursing"[Subheading] OR "nursing"[MeSH Terms] OR nursing) AND ("therapy"[Subheading] OR "therapeutics"[MeSH Terms] OR therapy OR "psychotherapy"[MeSH Terms] OR psychotherapy)	9	1	1
4.	("psychiatry"[MeSH Terms] OR pshychiat* OR "nursing"[Subheading] OR "nursing"[MeSH Terms] OR nursing) AND	2	0	0

	("rehabilitation"[Subheading] OR "rehabilitation"[MeSH Terms] OR rehabilitation OR psychosocial rehabilitation)			
5.	("psychiatry"[MeSH Terms] OR pshychiat* OR "nursing"[Subheading] OR "nursing"[MeSH Terms] OR nursing) AND ("mental health"[MeSH Terms] OR mental health OR "mental disorders"[MeSH Terms] OR mental disorder)	1	0	0

During the searches the articles were first sorted out by viewing the title. Those articles whose title was unclear of purpose or suited the inclusion criteria (137 articles), was selected to be reviewed by abstract. Again, the abstracts were seen in the light of the inclusion and exclusion criteria and the ones applying or still unclear in meaning were selected to be reviewed in full text (57 articles). Most of the found articles weren't included in the abstract appraisal phase, because some of the articles reviewed the harmful side of playing games, like video game or gambling addiction, some were more about the educational, preventive or promotive aspect of games in healthcare. Relatively many articles concerned about the treatment of attention deficit hyperactivity disorder, treatment of cerebral palsy with interactive virtual realities or computer games, or the education of healthcare professionals through games.

Within each database, duplicate articles were already excluded when comparing the titles in each new search. This has effected the number of relevant titles in the searches, but the number of same articles found with different search words within same databases was very small (0-3 articles a database). Later on, the duplicate articles from different databases were excluded after the full article review phase. There were three duplicate articles, and one article by the same writers and basic content, with a different title, in two different publications.

In the full text review process the articles were excluded because of various reasons concerning details. In some articles the participants weren't underage, but young adults. Some concerned describing different mental illnesses and the patients' needs in assessments, leaving further treatment development for later studies. Some articles were excluded because they were more of an expert opinion or an untested theory about the subject. Also there were a few research articles about "The Good Behavior Game" developed by Barrish, Saunders & Wolf (1969) (see for example Kellam, Brownb, Poduska, Ialongo, Wang, Toyinbo, Petras, Ford, Windham & Wilcox 2008), but due to the parlor game nature lacking any actual concrete game medium, these articles weren't included to the final analysis.

From the final selection of articles (6 pieces) the reference lists' titles were searched to see if there was any relevant new articles to add to the review. The selection process is described below.

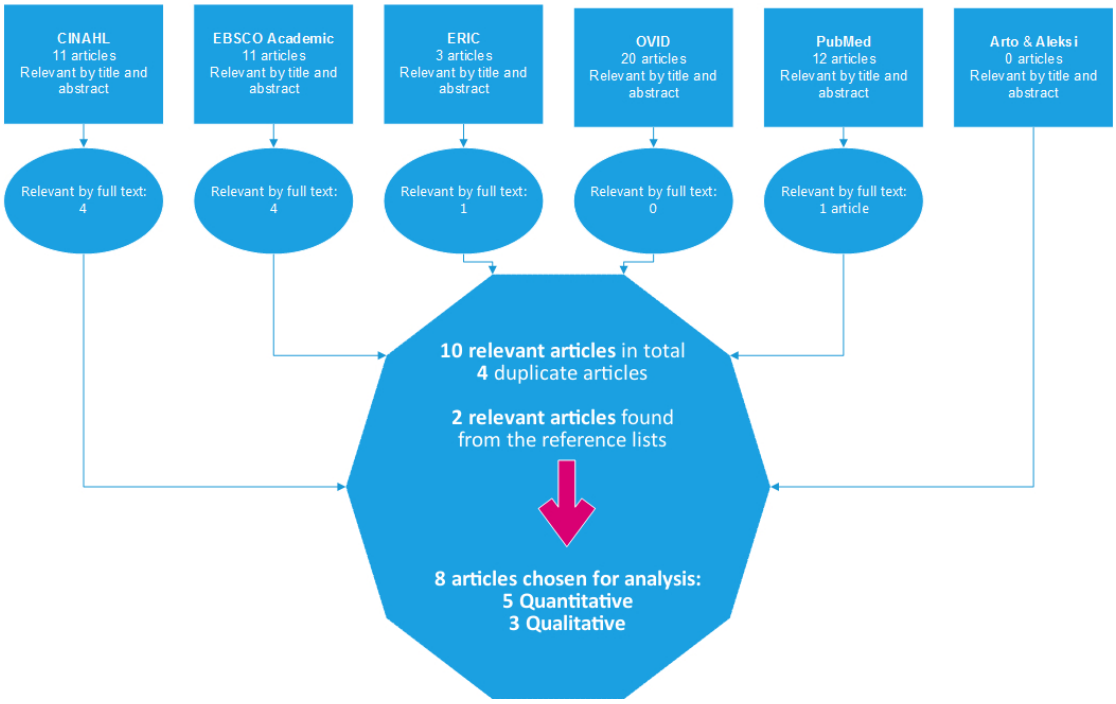
Table 8. Reference lists

Article	Titles relevant	Abstracts relevant	Full articles found and relevant
Knox, M., Lentini, J., Cummings, TS., McGrady, A., Whearty, K., Sancrant, L. 2011	15	6	1
Li, W. H. C., Chung, J. O.K., Ho, E. K. Y., Chiu S. Y. 2011	6	4	1
Matthews, M., Coyle, D., Antho-	1	0	0

ny, K. 2006			
Merry, S. N., Stasiak, K., Shepherd, M., Framptom, C., Fleming, T., Lucassen, M. F. G. 2012	8	4	3
Robson, M. 2008	3	2	0

Inclusion and exclusion criteria were the same as in the main searches. 33 articles were chosen from the reference lists to be searched within PubMed-database by title and author(s) on 29th of January 2015. There were no duplicate articles. Most of the titles were found, resulting in 16 relevant abstracts. A few didn't display any abstract or full text link. Some of the articles' abstracts were declined due the content not meeting the inclusion criteria, for example the research didn't involve any game. Some of the accepted article abstracts didn't include a link to a free article, in which case the article was excluded. 12 full, free and relevant articles were downloaded and inspected in full text. Out of these 12, 2 articles were chosen to be included to the review. Excluded articles concerned for example adults or not a game-type of intervention. Finally 8 articles in total were selected to be reviewed in this thesis.

Figure 1 Article selection process



5.4 Article appraisal

The essential nature of this study was to determine the methods already used in mental health rehabilitation of children and adolescents. In the hierarchy of evidence by Sackett et al. (1996) systematic reviews and RCT's are valued as the highest source of evidence (Aveyard 2010, 61-62), but regarding of the purpose of this thesis, it was considered to be more important to cover a large variety of utilization possibilities, despite the strength of evidence.

In this review there is 5 quantitative studies and 3 qualitative studies. Quantitative studies were by Fleming et al. (2012), Knox et al. (2011), Li et al. (2011), Merry et al. (2012) and Stallard (2011). Studies by Merry et al. (2012), Stallard et al. (2011) and Fleming et al. (2012) were randomized controlled trials (RCT's), which in this case were the articles with the strongest evidence. Out these three, a study of SPARX intervention by Merry et al. (2012) had the largest sample size. In their study the intervention group and the comparison group were very comparable, though the compar-

ison group was heterogenic and the results were based on self-report scales. A study of Think, Feel, Do intervention by Stallard et al. (2011) and another study of SPARX by Fleming et al. (2012) had quite small sample sizes, short follow-up periods and used self-report scales, but the participants were randomized appropriately and the studies were only considered to produce preliminary results.
In biofeedback intervention study by Knox et al. (2011) the intervention group and the control group did differ on the primary outcome measure on the baseline, though the difference was accounted for statistically. Also, the sample size was quite small and not randomized, but otherwise the measurements and the research process is well clarified. Interactive virtual space intervention study by Li et al. (2011) wasn't randomized either, but the sample size was larger and the data was collected with single-blind method. Data was collected with a self-report scale and there was no follow-up period.

Qualitative studies were by Robson (2008), Gillis (2003), Matthews et al. (2006). Robson's (2008) case study of a bereaved child in play therapy featuring a video game lacked details about the patient's background, evaluation about the involvement of the researcher and a clearly stated research question, but the sessions were appropriately described and background for the intervention was sufficiently declared. Gillis' (2003) pilot study about an interactive board game study lacked control group, the sample size was rather small and the results were rather briefly presented, but follow-up period lasted for a year and game functioning was described in detail. Another pilot study by Matthews et al. (2006) was more focused on the description of their intervention game Private Investigator and only briefly mentions some results produced in three clinics, but no other defined figures about the participants or measurement methods used were presented.

5.5 Data analysis

The content analysis was conducted with inductive approach, by thematising and typifying material. Inductive approach analysis aims to find the basic essence of a

certain phenomenon based on empiric material, without upfront assumptions or expectations. There's no standard patterns to perform the analysis, but the aim is to simplify information without losing any of it and creating new information at the same time. (Eskola & Suoranta 1998, 19, 138.) In the analyzing stage each article was read through again individually to gain a general impression of the material and how they might answer the research question. Some general themes on the articles begun to take form, but no decisions about the themes were decided at this point, but the first impression might have affected the further analysis.

The goal of thematizising is to find relevant and essential themes answering the research question (Eskola & Suoranta 1998, 175-176). When reading through each article for the second time, the content was compared actively to the research question. Sentences and paragraphs answering the question in any way, were cut out of the article. These segments were then individually re-examined and the quote was summarized as an emerging type. Below is presented an example of the thematizing at this point.

> *In collaboration with the therapist, the game allows clients to set their own therapeutic goals, recognize their own strengths and values, identify people in their lives who can support them, teach new coping strategies and focus on their future rather than their past. The game itself breaks this therapeutic process into a series of structured goals, which the adolescent can understand and achieve more easily.*
> Matthews et al. (2006)

➔ The game is utilized in mental health rehabilitation of children and adolescents **to create structure to therapeutic process.**

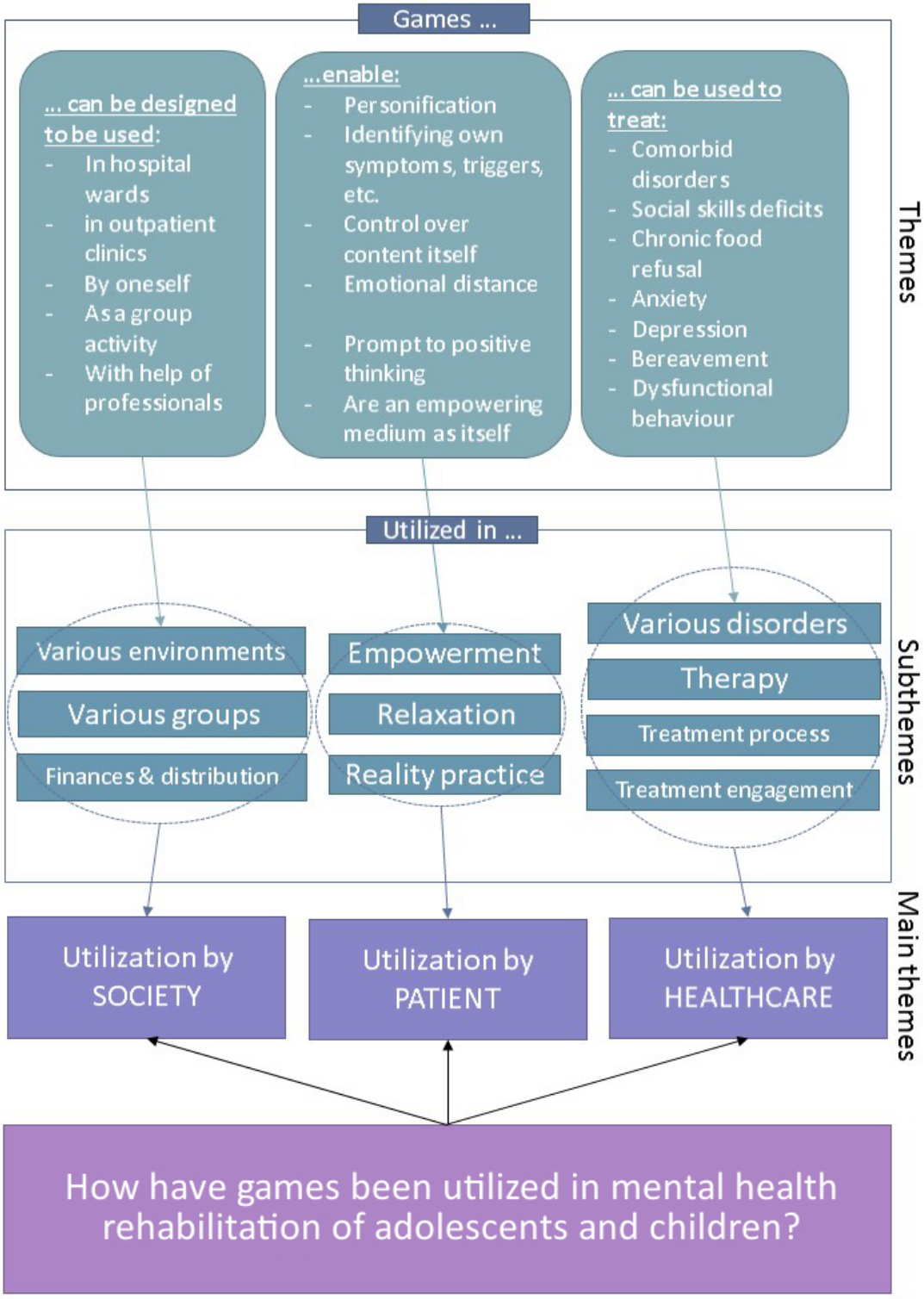
Any similar quotes were placed in the same group, but essentially each quote was given a theme individually. Some of the quotes also produced several themes, thus were used in multiple categories. This process resulted in some duplicate themes, where the themes were very similar in basic meaning. Duplicates were eliminated when transferring the material into digital form, to be further analyzed and typified.

After eliminating duplicate types, there was 52 subthemes to be found in the articles. During the writing it was necessary to go back to the original article to confirm the right context and meaning in which the arguments were presented.

Typifying requires always some sort of thematising of the research material beforehand, so that they can be arranged into types by searching for similarities between themes. These types aim to capsulize information further, but still present it comprehensively. Types in this thesis have been formed as extensively as possible, which means some of the included things might have been presented in only one article, some in several. (Eskola & Suoranta 1998, 182-183.) The 52 subthemes were typified into 14 main themes. For example, similar themes to the one presented before ("*Creating structure to therapeutic process*"), were also "*Combining therapeutic elements*", "*Strengthening the relationship between the therapist and patient*" and "*Providing content to therapy sessions*". These subthemes were typified into a theme "**Utilized as a part of therapy sessions**".

These 14 main themes were finally typified into three main themes exhibiting the main aspects of the ways games are utilized within mental health rehabilitation of children and adolescents. The process of this is presented in the picture below. Examples of subthemes are presented on the top, themes in the middle and main themes below.

Figure 2 Thematization & typifying process



6 Results

6.1 Games utilization by healthcare

Games utilized in treatment of various disorders

Five out of the eight accepted articles concerned the treatment of depression in children and adolescents as the primary outcome to be measured. In the research article of Knox et al. (2011) the priority disorder under investigation was anxiety, but according to their secondary findings, self-report depression scale scores declined slightly more than anxiety scales' scores among the treatment group. Private Investigator (PI) also included patients suffering from anxiety disorders and social skills deficits, in addition to those suffering from depression (Matthews et al. 2006). Otherwise SPARX (Fleming et al. 2012; Merry et al. 2012) and TFD (Stallard et al. 2011) interventions considered depression as their primary target. Also an interactive virtual space intervention (Li et al. 2011) targeted depression, but specifically the depression amongst cancer patients in hospital environment.

Though the main focus in SPARX and TFD interventions were depression, they aimed also to address multiple issues at the same time. Merry et al. (2012) also concluded that SPARX had positive effect on depression, anxiety, hopelessness and quality of life, though Fleming et al. (2012) didn't detect any effect on these matters. Whether or not the program was exactly the same in both studies didn't transpire in either of the articles. With TFD (Stallard et al. 2011) it was also noted that there was improvements in parent rated mental health scales, which they argue to indicate that the intervention made changes to the participants' visible emotional symptoms and behavior within the family.

Other disorders addressed in the found articles were chronic food refusal (Gillis 2003) and bereavement (Robson 2006). Differing from the rest of the articles, in Gillis' (2003) study the disorder was addressed with a traditional board game played

with the therapist and one parent, and in Robson's (2006) study of a bereaved child she utilized an existing entertainment video game "Zelda" within the ordinary play therapy sessions.

Games utilized as part of therapy

Games have facilitated a broad use of therapeutic elements in rehabilitation, but also a new platform to provide different forms of therapy. SPARX, in addition to being based on cognitive-behavioural therapy (CBT), has content like psycho-education, problem solving, activity scheduling, challenging and replacing negative thinking and social skills training, but also mindfulness exercises, learning relaxation techniques and relapse prevention methods (Fleming et al. 2012; Merry et al. 2012). TFD, also based on CBT, combined psychoeducation, emotional recognition and management, positive thinking and problem solving (Stallard et al. 2011). Cognitive-behavioural themes are also used in studies by Knox et al. (2011) and Li et al. (2011). Gillis (2003) reports to have succeeded in combining several behavioral techniques in the board game.

One reappearing cognitive-behavioral theme in the games are goal setting and rewards for reaching those goals. The most straightforward method this is in Gillis' (2003) boardgame, where the child gets a prize for trying a new food. Prize-like themes are also displayed in PI as keys to the next level (Matthews et al. 2006). Prize and punishment themes are displayed in Robson's (2008) and Knox et al. (2011) studies as outcomes depending on the player's performance in the game task.

PI is based on solution focused therapy (SFT) and is said to enable a new way for the therapist and the adolescent to create a connection, but also to be a valuable asset in therapy by facilitating less daunting conditions for the adolescents to address their issues and concentrate in their therapy goals. (Matthews et al. 2006.) In Robson's (2008) play therapy sessions the game provided a base for conversation, though possibly revolving around the subject on a more abstract level than in Personal Investigator.

Matthews et al. (2006) also claim that the PI facilitates the adolescents to understand the therapeutic process by setting very structured goals. Researchers using SPARX (Fleming et al. 2012; Merry et al. 2012) and TFD (Stallard et al. 2011) also present that both games are very structured with clear different themes on each level, but don't mention this as an asset in the treatment.

In three studies the game was used as a part of therapy sessions, as in the rest of the studies the games were in the main role, being the sole intervention being tested. In the PI intervention the hour long therapy sessions were based on the use of the game for 30-40 minutes. (Matthews et al. 2006). Robson (2008) also used Zelda in a more supportive role in the therapy. Knox et al. (2011) used their biofeedback game as a continuing part of their sessions after the psychoeducational part.

Games utilized in treatment process

Merry et al. (2012) stated that in SPARX, participants who aren't improving within the game are prompted to seek help, but it is not clearly stated whether the game does this or the professional supervising the trial. They also claimed that the positive results achieved were impressive for a sole self-help program. According to their findings SPARX was determined to be at least as appropriate as the ordinary treatment offered in primary healthcare sites in New Zealand (Merry et al. 2012). SPARX was offered instead of traditional treatment (Merry et al. 2012; Fleming et al. 2012). In Stallard's et al. (2011) study they picked their participants from a waiting list to see CBT specialist, but the possible effect of the intervention on the following therapy wasn't studied.

Medications' effects on the game interventions weren't followed in the studies, though in study by Knox et al. (2011) some of the participants were under medication addressing anxiety or depression, but none received other additional therapies at the same time with the study. In the other studies there were no mention about the additional medication or therapy the participants might've received.

Although not directly within the collected material, Merry et al. (2012) compare in their article their self-report completion scores with the YouthMood project, in which the program itself collected the information in question. Also in PI the progress of the patient is monitored, but it seems to be more focused towards the patients' needs than the professionals', since the recording notebook in the game is described very briefly just as a tool to save and observe progress in the game. (Matthews et al. 2006).

The patient's responses throughout the game were saved and it was possible to return to the previous data in TFD (Stallard et al. 2011) and PI (Matthews et al. 2006). Also SPARX displayed a reflection of learning at the end of each level, though the level of patient's personal effect on the things reflected is not mentioned (Fleming et al. 2012). The game also monitors "homework" provided in the game or the patient can use the paper notebook provided with the game (Merry et al. 2012).

Games utilized to engage patients in treatment

In Merry's et al. (2012) satisfactory questionnaire the participants were only slightly more pleased with face to face therapy than SPARX-program, but still over 81% of the participants would recommend SPARX to a friend. Stallard et al. (2011) conducted a satisfactory questionnaire as well, in which most participants reported to be highly satisfied and to, if possible, recommend TFD to others facing similar problems. In Matthews' et al. (2006) study, both the participants and the therapist were satisfied with the game. Researchers (Matthews et al. 2006; Merry et al. 2012; Fleming et al. 2012; Knox et al. 2011) argue that games might be more appealing and engaging form of treatment to children and adolescents. Stallard et al. (2011) also state that children who agreed to participate were satisfied and engaged with their program. Video games are seen as a natural part of today's youths' life, which makes the treatment more appealing (Knox et al. 2011; Merry et al. 2012), or through games it is possible to benefit from some other youth culture phenomenon (Matthews et al. 2006). Otherwise engaging features in video games might be the chance to personal-

ize the character (Fleming et al. 2012; Matthews et al. 2006). Gillis (2003) and Matthews et al. (2006) also saw games as a less threatening form of treatment for the patients. Flexibility with timing and place is also seen as a benefit to the patients, as the games can be used in clinics (Matthews et al. 2006; Knox et al. 2011; Gillis 2003), at school (Fleming et al. 2012) or at home (Stallard et al. 2011). Li et al. (2011) appeared to emphasize the prudence towards the children regarding the timing of the intervention, to facilitate the participation.

6.2 Games utilization by patient

Games utilized in relaxation

The biofeedback intervention (Knox et al. 2011) was essentially used for relaxation purposes. Relaxation techniques were learnt by recording skin electrodes that modulated through the game according to heart rate variability and skin conductance level changes of the patients (Knox et al. 2011). The measurements were modulated in the game to help with practicing physical relaxation, even in challenging situations presented in the game. SPARX (Fleming et al. 2012; Merry et al. 2012) and TFD (Stallard et al. 2011) interventions also included teaching relaxation techniques, but without biological monitoring aids.

Other way to create relaxation was studied in the research by Li et al. (2011), where one of the participating children expressed the computerized play therapy intervention to be a relaxing distraction in stressful circumstances. They argue, that emotional focused coping methods (Lazarus & Folkman 1984), like relaxation and distraction, restrain depressive symptoms (Li et al. 2011).

Games utilized in empowerment

Common content in all the found articles, except in Robson's (2008) study, was that the participants had some sort of control over the content of the game or the session. Robson's (2008) case study concerned play therapy, where the patient could choose between the video game and other creative play.

In Li's et al. (2011) and Knox's et al. (2011) study the participants had control over the game chosen for the session. In Gillis' (2003) study the foods tried during the game were picked by the participants individually. In both SPARX (Fleming et al. 2012; Merry et al. 2012) and TFD (Stallard et al. 2011) the patient was prompted to e.g. identify their negative thoughts and different emotions, but also to think how to deal with them and apply learnt coping methods into real life. Problems assessed in CBT based games were in the end very similar to problems addressed in SFT based PI intervention (Matthews et al. 2006). Matthews et al. (2006) also argue that presenting therapy as simple game goals the adolescents understand and achieve those goals more easily. Setting personal goals and finding help to reach that goal was also a common theme in SPARX, TFD and Personal Investigator.

Matthews et al. (2006) say that PI prompts the patient to consider the positive events of the patients' lives and aspects that they like in themselves. This theme also is seen in one of the SPARX's levels (Merry et al. 2012), where the patient is asked to challenge or change negative thoughts into positive ones. The game itself is also seen as an empowering environment, with cathartic effect (Matthews et al. 2006) and greater flexibility (Li et al. 2011). Fleming et al. (2012) mentions game's possibilities to utilize game elements, like voice overs and music, with the actual content. SPARX (Fleming et al. 2012; Merry et al. 2012) also enabled the patient to create a personalized avatar for oneself. Matthews et al. (2006) present that 3D fantasy environment with room for personification inspires the patient to engage more actively with one's therapy. Robson (2008) also argues that game might offer even tighter environment to gain emotional distance and containment compared to free play, which might enable, as Cattanach (1995) suggests with the theory about play spaces, reconstruction and confrontation difficult experiences (Robson 2008).

Games utilized in simulating reality

Real-life connection is mentioned in all of the articles. In Gillis' (2003) study the participants were followed through a year to see if the changes transferred from the gameplay to everyday life. In biofeedback-intervention (Knox et al. 2011) a change in

difficulty, a particularly stressful situation, is presented to enable the patients to practice relaxation in real-life like events. SPARX (Fleming et al. 2012; Merry et al. 2012), TFD (Stallard et al. 2011) and PI (Matthews et al. 2006) the in-game exercises are designed so that the participant has to think and apply the themes emerging into their own personal lives and situations, but get practice also through homework type of assignments. Li et al. (2011) state that the interactive virtual space is a platform where otherwise restricted children have the possibility to be involved in real-life like situations. Matthews et al. (2006) and Robson (2008) also present that the game establishes a safe environment where to experiment with feelings and behavior.

6.3 Games utilization by society

Games utilized in various environments

In Li's et al. (2011) study the interactive virtual environment was used in a hospital ward environment in small groups of children, with help from the nurses. In other studies the games were used for outpatients, either at home, school or clinic. In studies by Fleming et al. (2011) and Merry et al. (2012), games were used without the professional help, by the patients individually on their own. In studies by Knox et al. (2011), Robson (2006), Gillis (2003), Stallard et al. (2011) and Matthews et al. (2006), games were utilized with a professional in clinical environment.

Notable is, that Robson (2006), Gillis (2003) and Matthews et al. (2006) used their games as a remarkable connection facilitator between the patient and the therapist, though in slightly different ways.

Games utilized in various groups

In Fleming's et al. (2012) study the main focus was on adolescents excluded from mainstream education, i.e. youths from deviant socio-economic environment, gender, age and ethnicity. Merry et al. (2012) also state in their study that the positive results of SPARX didn't seem to be caused by either gender, ethnicity or environment setting, though there was considerably less ethnical diversity than in Fleming's et al. (2012) study.

Albert, MacKay, Stewart, Saewyc and the McCreary Centre Society (2007) and Clark, et al. (2010) argue that youths in alternative education don't seek help for their mental health problems and don't use mainstream healthcare services, thus SPARX-intervention has been developed to satisfy this need among other things (Fleming et al. 2012). Other arguments presented against treatment as usual by Compton, Burns & Egger et al. (2002) is that 20-50% of youth treated with CBT don't benefit and evidence-based treatments don't reach their target (Knox et al. 2011). Kataoka, Zhang & Wells (2002) and Mariu, Merry, Robinson & Watson (2011) state that fewer than a fifth of youths with depressive disorder receive treatment, either partly because according to Layard, Bell & Clarke (2006) there's no sufficient workforce, or according to Le Surf & Lynch (1999) the youths are reluctant to seek traditional treatment (Merry et al. 2012).

Games utilized in finances & distribution

According to Stallard's et al. (2011) findings, their TFD computerized CBT-intervention effected positively on children's mental health while they were on waiting list for face to face CBT. Merry et al. (2012) state that SPARX-treatment might be cheaper than treatment as usual, which is backed up with the fact that SPARX is entirely a self-help resource, though it is admitted that the effect would need to be investigated more thoroughly. Stallard et al. (2011) also argue that their TFD-program is a potential way to make CBT ideas more accessible with low costs, because TFD facilitator only requires minimal training about the CBT. Other programs that didn't require a professional facilitator were SPARX (Merry et al. 2012; Fleming et al. 2012), TFD (Stallard et al. 2011) and biofeedback game (Knox et al. 2011). SPARX (Merry et al. 2012) and TFD (Stallard et al. 2011) were delivered to patients on CD-ROMs, which are easily distributed. Interactive virtual space intervention (Li et al. 2011) was facilitated by nurses with two hours of training to implement the intervention. Gillis' (2003) board game and Matthews' et al. (2006) PI game were both designed to help the professional therapist in their work, thus required a specialist.

Another fact increasing the distribution possibilities is the lower treatment threshold displayed in some of the studies. Fleming, Dixon and Merry (in press) state that offering SPARX to whole classes was very practical to reach those in need of help, when the stigma and few seeking help were reported to be the major hindrance to treatment (Fleming et al. 2012).

7 Discussion

7.1 Reliability, validity and ethical considerations

Though this thesis follows the structure of a systematic literature review, the shortcomings make the study vulnerable considering its reliability and validity. According to Pudas-Tähkä & Axelin (2007, 46-49) a reliable systematic review always calls for two researchers. There's a possibility that the contribution of just one researcher has affected the selection process of articles and something valid to this thesis might've been missed. This also eliminated the possibility of second opinion when choosing the articles, thus the personal interests and motives of the researcher might have affected the selection. This has been tried to minimize by defining inclusion and exclusion criteria, and following them closely. Also description of the selection process has been written in as much detail as possible to let the reader see through the research process and have the possibility to evaluate the credibility of it. This has been kept in mind throughout the research process and reporting it.

The databases where the searches were conducted were concentrated on the articles published in the English-speaking world, thus this thesis lacks knowledge of possible studies made in other parts of the world. Though in this case this might mainly concern European studies, since one of the selected studies was conducted in Hong Kong and another in New Zealand. Besides the lack of multicultural material, also the search for unconventional sources and search by hand through selected publication

series weren't conducted in this thesis, thus limiting the comprehensiveness of the study. The requirement for free articles limited the usable material, too.

Due to researcher's inexperience, some apparent mistakes were noticed after the selection process. It was challenging to find optimal search words for each database, and in retrospect, some "care" related search words might've added to the study. Due to immediate elimination of duplicate articles, it's hard to determine the exact amount of relevant articles found within each search. For the sake of the purpose of this thesis the quality of the studies wasn't really limited. Only limiting quality was that the article couldn't be a personal opinion or theory with no back-up, but a real life tested case or method. Thus the strength of evidence overall in this thesis can't be considered strong enough to be presented as "good practice", let alone evidence based practice. The purpose of this thesis was to present as many ways as possible to utilize the games, which wasn't seen as a demand for strong generalizability.

In qualitative studies the evaluation of reliability and analyzing the research material are very closely knitted together. The researcher has to continuously observe and evaluate the choices done and at the same time address the coverage and the reliability of the study. Usually there's no other aids in analyzing the material other than pre-defaults by researcher oneself or research colleagues, everyday knowledge and theoretical knowledge. (Eskola & Suoranta 1998, 209) The danger in using quotations in thematizing is reliability and validity. When only few quotes are presented, the reader has to trust researcher in interpretation of the material. On the other hand, with a variety of quotes presenting the material, the study might come out as a trivial report. There is no absolute rules about the amount of quotations, but the reader should keep in mind the subjectivity of the researcher. The role of the researcher is not to be as objective as possible, but to portray and explain one's role in the research in as much detail as possible.
(Eskola & Suoranta 1998, 16-18, 180-181.) The nonexistence of presented quotes exposes the reader only to the researcher's view of the material. During the analysis it was taken great care to view each quote in the context the original article's writers'

have presented it, and preserve it still in the thesis. Though it is possible that the effect of the original articles might've lessen throughout the further typifying process. The analyzing process can't be called objective, and it only presents the logic, thinking process and knowledge of the author.

Premise to qualitative study is the open subjectivity of the researcher and acknowledgment of it. In qualitative study the main criteria for reliability is the researcher oneself and the evaluation concerns the whole research process. In qualitative study there's seldom used the terms reliability and validity, and some argue that they don't apply to a qualitative study. (Eskola & Suoranta 1998, 211-212.) Though according to Grönfors (1982, 174, 175-176) the inner validity reflects the researcher's knowledge about the scientific area and scientific way of working. Reliability on the other hand refers to the interpretation of the material, whether or not it's clean and not arguable. (Eskola & Suoranta 1998, 214.)

Though there's no absolute views on repetitiveness or consistency in qualitative studies as in quantitative studies, it should still be questioned whether or not the information is honest and how it is determined and has the nuances within the text been truly understood. A well-made analysis of a text views the material critically and evaluates the relationship between the writer, the subject and the reader. (Metsämuuronen 2006, 247-248.) In the end, reliability of a research is mainly about convincing the scientific audience, who according to Mertonism in scientific thinking should systematically question everything in the name of ethics. (Eskola & Suoranta 1998, 210)

The ethical considerations in this thesis concerns about the good research practices and the values in science. Merton's (1942 & 1973) three other norms in ethos of science are universalism, where researcher's personal attributes don't affect the acceptation of one's statement, sense of community, where all the results are public and available for the whole scientific community, and gratuitous search for new scientific knowledge. (Kuula 2011, 25-26.) Also Pietarinen (1999) has presented similar re-

quirements for the researcher, but the norms reach beyond the scientific community. The researcher should be truly interested in the subject at hand, honest and diligent, eliminate the possible danger deriving from the testing, respect the human dignity, carry social responsibility, promote one's professional practice and respect one's colleagues. (Kuula 2011, 30.) Due to the research method, there's no ethical considerations to be done regarding research subjects. Mainly the ethical considerations concern the honesty and publicity of this thesis, which have been addressed earlier.

7.2 Conclusions & future recommendations

This thesis displays that games can be utilized diversely in treatment, for the benefit of the patient and society. Though the evidence presented couldn't be considered as very strong, and lacks Finnish viewpoint on the matter, based on the results, developing the matter further is worthwhile. Games aren't just a source of addiction, but can be used to care and empower when utilized appropriately. The aim of this thesis was achieved, though the material in its entirety is rather small and nationally narrow. Because the literature review was conducted by one person only with limited time and access to databases, there's absolutely no claim that this thesis would consist even nearly an overall view of research done about games in children's and adolescents' mental health care. Still, it gives a grasp of what's been done and some ideas of what direction should be headed next.

As it is presented in a SPARX study by Merry et al. (2012), treatment was determined to be at least as good as the current offered treatment. Games can be leveled up to the standard of "official" treatments, thus validating their place as a treatment form next to others. Games reviewed in this thesis utilized mainly two different therapy forms and proved to be a useful medium to deliver or help delivering the therapy form to patient. Exceptional use of a game was in Robson's (2008) study, relying mostly on the interpretation of the therapist. Otherwise the games were mentioned

to be easy to use by the patient by themselves or by a healthcare professional with no demanding education about the therapy approach in question.

This is one thing supporting the cost-effective viewpoint of any type of game intervention. Health care professionals usually have some sort of knowledge about the principles of different therapy approaches, and even in the Ethical Guidelines of Nursing (2014) there's precepts stating that the knowledge and practice should be improved continuously. With little additional studying, new methods could be added to the treatment repertoire of "ordinary" nurses. Also, if different therapy methods can be combined together, why not multidisciplinary approaches to a problem, too. Getting holistic treatment information from a single place would be beneficial to the user, but could also improve the cooperation of different professionals. Other thing brought up in the studies is definitely the distribution of the game interventions, especially the video game ones. Though the games were distributed in CD form, loads of game material is already downloaded from the internet without the quality of the game suffering.

Most of the found games treated anxiety and/or depression, which are a major issue in Finland too. In LATE-survey, in years 2007-2008 there were 1540 children surveyed across country in scheduled health checks. According to this survey, 14% of girls and 3% of boys on 8th and 9th grade suffered from mild depression symptoms, and 7% of girls and 1% of boys suffered from average or severe depression symptoms. 18% of girls and 5% of boys on the 8th grade told that they experience anxiety or nervousness quite easily or exceptionally easily. (Lasten terveys 2010, 5, 61.) Though there were hopes to find greater variety regarding different disorders and their treatment in this research, maybe these disorders are the major current issues that need to be focused on. But since comorbidity is very common with adolescents, it should be investigated further if multiple disorders could be addressed within the same game, adding or removing modules or levels as needed. E.g. in SPARX different modules included different subjects they covered in each individually.

In the proposals for development for mental health work and the social work with substance abusers to 2015, it is stated that the development of children and adolescents doesn't follow the health care system's division into mental health, social and pedagogic development, thus the promotion, care and prevention should be seamless. The focus on the services with children and adolescents has to be on the primary level, and on the outpatient clinics, with the support of special health care services. (Mielenterveys- ja päihdesuunnitelma 2012, 51-53.) Usually 15-25% of adolescents suffers from mental health disorders, when according to surveys studying the use of mental health services, only 20-40% of adolescents get help for their disorder (Marttunen & Kaltiala-Heino 2014). Rimpelä (2010) lists in his article different professionals' availability for those in compulsory school and second stage degree students, and according to her 67% of compulsory schools stated that nurses were available less hours than recommended. Also doctors were only in exceptional cases available as much as recommended. Psychiatric nurses were available in 13% of upper level schools and 4% of elementary schools. He also states that developing school and student healthcare separately from the school environment and focusing on singular patients care and monitoring, the resources are very small. Also almost 10% of each age group isn't in the student/school healthcare. (Rimpelä 2010.) Reflecting on these statistics, there seems to be something wrong with the coverage and the extent of the current health care services. How to reach out to those who need help, let alone those who have "dropped out of the system"?

Hoikkala (2010) states that in media society mass media and technology control people's lives. He wonders what kind of bond is created in the internet, when the social interaction doesn't happen face-to-face. He argues that though there's still "traditional" communities, there's also some sort of unity within all Finnish youths, who have grown up with the mass media, consumerism and entertainment culture. In his article Hoikkala presents that modern youth are extremely individualistic and communal at the same time. Internet has created new ways to express negative emotions, but also new forums for peer support and positive social interaction in networks. (Hoikala 2010.)

Facilitating adolescents to find help to their mental health problems is difficult, as proves the statistics about mental health service use. As the Pelaajabarometri (Mäyrä & Ermi 2014) study's results suggests, the youth now is the generation of games and internet, thus maybe the technology should be treated as a way to make a connection with the them. The development to move the care focus to the primary level is on different stages between areas. Network based services are mentioned to be included in functional primary level of services. The threshold to find help has to be kept at a low level. Developing outpatient care is said to decline the need of inpatient care in children's and adolescents' metal health. (Mielenterveys- ja päihdesuunnitelma 2012, 51-53.)

The need for human contact seemed to be still important to the participant in the studies. Though generally the satisfaction with the game intervention was good, it was still stated that some preferred the face-to-face contact with a therapist more (e.g. Merry et al. 2012). Partly this might be because of the unfamiliarity of the treatment form, maybe the prejudice and the stigma effect the thoughts about mental health in general, and what the appropriate treatment should be. It also might indicate that the suitability of a planned game intervention should be evaluated individually. Though in the studies the participants seemed to be satisfied with the game used regardless of gender, educational or cultural background, it would be interesting to examine if there could be some group not benefiting from game intervention, e.g. socially excluded. Using treatment from home, on the other hand, could be useful for those wanting to practice outside social contact first before implementing it in the "real-life".

If adolescence is, as Havighurst it presents a process, where at the end there's an independent adult, like the games have shaped the therapeutic process into small goals, could it be possible to reshape becoming independent? Youth struggling from difficulties in normal everyday interactions and functions could benefit from interactive instructions e.g. how to open a bank account, using public transportation, plan-

ning meals and cooking, etc.. Though the games doubtfully could address deeper issues like the parent-child relationship, help in very concrete things could leave more resources for the child to deal with other issues.

Commitment to treatment is beneficial to both healthcare and the patient. As what comes to the aspects that motivate and engage the patients to treatment, weren't really addressed in the studies. Some hints about it were made, like the game environment (e.g. Matthews et al. 2007), personalizable content (e.g. Matthews et al. 2007) and prizes (e.g. Gillis 2003). To make the game "fun" and engaging, to avoid the problem mentioned by Granic et al. (2014), it would be appropriate to examine in more detail what makes the game engaging for the patient.

There's still a world of shame, guilt, lack of knowledge and fear of stigma surrounding mental health problems, which all delay searching for help and adds to the burden of the social environment of the victim (Toivio & Nordling 2011, 85). Though this thesis didn't include educational games or promotive games, in the SPARX study of Fleming et al. (2012) the game was introduced to whole classrooms at the time to max the participation, but also to diminish the effect of stigma. This might be a method for early recognition of mental health problems and early admission to care. Also diminishing stigma related to mental health problems could be addressed in schools when introducing the program for everyone, it including the necessary psychoeducational aspect. Matthews et al (2007) mentions that they used detective metaphor partly because detective stories are popular with adolescents. Using something from the popular culture could appeal to children and adolescents, and help with the stigma.

Though to this thesis there were no Finnish articles to be found, it doesn't mean the possibility hasn't been noticed. Web-based treatments have been developed in Finland, for example Oivamieli (n.d.) and the BED self-help programme recommended by Käypä hoito: "Irti ahminnasta" ["Getting rid of binging"] in Mielenterveystalo (n.d.). Self-care websites are a step towards more interactive and self-reliant treatments. With the new Kanta-website providing the citizens with personal records

from healthcare professionals, there's no saying that at some point in the future, there could be some interactive intervention on secure channels, too.

Subjects for future research, which came up as unanswered thoughts while reading through the material, were the results of medication and game interventions together in mild cases of anxiety and/or depression. The studies also concentrated on the positive effects or testing the assumed positive effect of the intervention. Because there's contradicting evidence about the use of games, e.g. addicting qualities, it should be examined whether there could be other problematic issues regarding the use of games.

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Appendix 1 Selected articles

Author(s), year published, publisher Database	Title	Participants and intervention	Essential results	Type of research
Fleming, T., Dixon, R., Frampron, C., Merry, S. 2012 Behavioural and Cognitive Psychotherapy British Association for Behavioral and Cognitive Psychotherapies (Pubmed)	A pragmatic randomized Controlled trial of computerized CBT (SPARX) for Symptoms of Depression among adolescents excluded from mainstream education	Adolescents aged 13-16 (n=32) with almost certainly suffering from depressive disorder according to CDRS-test, recruited from alternative education schools, educational programme for temporarily excluded students or transition programme for alternative education school graduates. Computerized cognitive behavioral therapy game SPARX containing seven levels to be completed within 4-7 weeks, 1-2 levels per week, to treat depression. SPARX was played during class time or individually at school. Participants were separated into treatment group (n=20) and into waitlist control (n=12), meaning that the study was an immediate vs. delayed intervention randomized controlled trial. The study was supervised by a professional by	The primary results were measured with an observer-rated scale CDRS-R, complemented with self-report scales. 81% of the participants completed 4 or more levels and 69% completed all 7 levels. The results of both groups were compared with each other. There were significant reductions in the observer rated scales, but not in the self-report scales for both groups after receiving the intervention. Positive effects consisted for at least 10 weeks after intervention for the first intervention group.	Quantitative RCT

		weekly visits or phone calls.		
Gillis, L. 2003 Child: Care, Health & Development Blackwell Publishing Ltd. CINAHL	Use of an interactive game to increase food acceptance – a pilot study	6-year-old children (n=?), who have suffered from selective eating for at least 4,5 years, without any explanatory medical conditions. Interactive board game to be played with a dice, with individual food challenges for each children. The game was played with a therapist, mother and the child. The sessions occurred once a week, and the final goal was to complete a 42 item list of foods the child categorized as "ready to try" or "maybe try". Children would get a prize for every new food tried and an additional prize of higher value when the whole item list was completed. The mother also received some education about how to motivate her child to try new foods.	The children were interviewed individually by a Registered Dietitian to categorize different foods being refused. The game was proved to be an effective method to treat the condition, since all the children eventually completed the 42 item list and thus increased their repertoire of acceptable foods. The changes consisted in home settings and persisted for 1 year after the study.	Qualitative Pilot study
Knox, M., Lentini, J., Cummings, TS., McGrady, A., Whearty, K., Sancrant, L. 2011	Game-based biofeedback for paediatric anxiety and depression	Children aged 9-17 years (n=30) with symptoms of anxiety or diagnosed anxiety. They were referred to the study by nurse practitioners, physicians and mental healthcare providers.	The intervention significantly impacted the intervention group scores in all self-report measures compared to the comparison group. It was determined that the intervention affected the physiological state of the participants, and	Quantitative, non-randomized, with comparison group.

Mental Health in Family Medicine **Radcliffe Publishing** **CINAHL** **EBSCO Academic**		The participants were divided into an immediate intervention group and to waitlist comparison group. The baseline and straight after the intervention information was gathered with self-report scales (MASC, CDI and STAIC). The goal was to reduce participants' anxiety symptoms by introducing relaxation methods combined with psychoeducation. In the 8 session biofeedback intervention electrodes were connected to skin to record changes in heart rate variability and skin conductance level, while the participants were playing games which aim was to relax the user. The games used are Freeze-Framer 2.0 and Journey to the Wild Divine: the Passage software.	that psychoeducation about physical and physiological factors in anxiety alleviates depression and anxiety. Research suggests that the biofeedback intervention is useful to adolescents with anxiety by decreasing anxiety and depressive symptoms.	
Li, W. H. C., Chung, J. O.K., Ho, E. K. Y., Chiu S. Y. **2011** **Journal for Specialists in Pediatric Nursing** **Wiley Periodicals, Inc.**	Effectiveness and feasibility of using the computerized interactive virtual space in reducing depressive symptoms of Hong Kong Chinese children hospitalized with	Children aged 8-16 years (n=122) diagnosed with any type of cancer at least 6 months prior. The intervention was carried out in a pediatric oncology. The scale used was a self-report scale CES-DC, at baseline and again 7 days after admission. The comparison group received the usual	A little over half of the patients showed some depressive symptoms (CES-DC over 16) on admission and on the end of the intervention. The depressive symptoms were significantly reduced in both groups over time, but the intervention group reported more decrease in their depressive symptoms than the control group on day 7.	Quantitative With control group Non-randomized

EBSCO Academic (CINAHL)	cancer	care and the experimental group received 30 min daily group sessions in addition to the usual care. The game used was PlayMotion, which is an interactive virtual play environment with different types of games.		
Matthews, M., Coyle D., Anthony K. 2006 **Therapy today** **British Association for Counselling & Psychotherapy** **CINAHL** **EBSCO Academic**	Personal investigator	Adolescents in psychotherapy (n=?). 3D computer game, "Personal Investigator", developed to help interaction between the patient and the therapist. There has been utilized solution focused therapy as a baseline for the game. The preliminary study has been executed in three different clinics. Feedback from the game has been collected by using post-questionnaires and therapist interviews.	By pilot evaluation the findings have been promising in involving adolescents to their therapy. Personal investigator can boost the amount of interaction between the patient and the therapist, build structure to therapy process and assist in setting therapeutic goals.	Qualitative Pilot study
Merry, S. N., Stasiak, K., Shepherd, M., Framptom, C., Fleming, T., Lucassen, M. F. G. 2012 **The BMJ** **PubMed**	The effectiveness of SPARX, a computerized self-help intervention for adolescents seeking help for depression: randomized controlled non-inferiority trial	Adolescents aged 12-19 years (n=187) with clinically significant depression seeking for help. The participants were recruited from youth clinics, general practices and school based counselling services. The experimental group received interactive computerized cognitive behav-	For a self-help program, the intervention caused impressive clinically significant decrease in depression, anxiety, hopelessness and also enhanced the quality of life. SPARX is claimed to be at least as good as the usual treatment for depression. The effects endured to 3 months after the intervention was completed. SPARX was more effective	Quantitative RCT

		ioral therapy game (SPARX) sessions, containing seven levels to be completed within 4-7 weeks. The control group was admitted to usual face to face therapy. Primarily the results were measured with an observer rated scale CDRS-R for depression, but there was also collected 5 other self-rated scales from the subjects.	than the usual treatment for those more depressed at the beginning.	
Robson, M. 2008 British Journal of Guidance & Counselling Routledge EBSCO Academic ERIC	The driver whose heart was full of sand: Leigh's story – a play therapy case study of a bereaved child	9-year old boy suffering from the loss of a brother. Admitted to therapy due to sleep difficulties and abnormal behavior. The intervention was 8 sessions of play therapy, of which 3 sessions involving a video game called Zelda. A well-being and involvement questionnaire, somatic and behavioral information was collected before the intervention.	The case suggests that the video game was helpful media to confront fears, reconstruct experiences and gain emotional distance and containment.	Qualitative Case study
Stallard, P. Richardson, T., Velleman, S., Attwood, M. 2011 Behavioural and Cognitive Psychotherapy	Computerized CBT (Think, Feel, Do) for Depression and anxiety in children and adolescents: Outcomes and feedback from a	Adolescents aged 11-16 (n=20) diagnosed with mild/moderate depression or anxiety disorder. The participants were recruited from Child and Adolescence Mental Health Services. 6-session CD-ROM interactive pro-	According to feedback from parents there were no changes in their children's mental health, but emotional symptoms, hyperactive and total difficulties subscales were improved. According to the participants self-rate scales their symptoms in social phobia,	Quantitative RCT

British Association for Behavioral and Cognitive Psycho-therapies (Pubmed)	Pilot randomized Controlled Trial	gramme with graphics, music, cartoons, video clips, quizzes and exercises. The CD was provided to the participants to be used in their own time. As baseline and follow up measures the parents filled out SDQ-questionnaire and their child participating used the self-report scales SCAS, AWS, RSEI and SCQ.	depression and cognitive schemas were significantly improved. The children and adolescents were satisfied with the programme from moderate to high.	